

# CORNELL UNIVERSITY ANNOUNCEMENTS

## *Medical Sciences*

1956-1957 *and* 1957-1958

ANNOUNCEMENT OF THE GRADUATE SCHOOL  
OF MEDICAL SCIENCES



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GRADUATE SCHOOL OF  
MEDICAL SCIENCES

*Cornell University Medical College*  
*1300 York Avenue, New York 21, N.Y.*

1956-1957 AND 1957-1958

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# CONTENTS

Graduate School of Medical Sciences . . . . .	3
Officers of Administration and Faculty . . . . .	3
Cornell University Medical College . . . . .	7
Graduate School History . . . . .	7
The Graduate School of Medical Sciences . . . . .	7
Facilities . . . . .	7
The Medical College and the Sloan-Kettering Institute . . . . .	7
Purpose and Nature of the Graduate School . . . . .	8
General Regulations . . . . .	9
Admission . . . . .	9
Credentials . . . . .	10
Registration . . . . .	10
Major and Minor Subjects . . . . .	11
Special Committees . . . . .	11
Grades . . . . .	12
Residence Requirements . . . . .	12
Language Requirements . . . . .	13
Examinations . . . . .	14
Essays and Theses . . . . .	15
Noncandidates . . . . .	15
Expenses . . . . .	16
Summary of Regulations . . . . .	17
Fields of Instruction . . . . .	19
Instruction at the Medical College . . . . .	19
Anatomy . . . . .	19
Biochemistry . . . . .	19
Microbiology and Immunology . . . . .	19
Pathology . . . . .	20
Pharmacology . . . . .	20
Physiology and Biophysics . . . . .	20
Public Health and Preventive Medicine . . . . .	21
Instruction at the Sloan-Kettering Institute . . . . .	21
Biochemistry . . . . .	21
Biology and Growth . . . . .	21
Biophysics . . . . .	22
Pathology . . . . .	22
Preventive Medicine . . . . .	22
Register of Students . . . . .	23

# CORNELL UNIVERSITY

## GRADUATE SCHOOL OF

### MEDICAL SCIENCES

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\*On military leave.

# CORNELL UNIVERSITY

## MEDICAL COLLEGE

### GRADUATE SCHOOL HISTORY

WORK leading to an advanced degree was first offered in the Medical College in 1912 as a cooperative arrangement with the Graduate School of Cornell University. Under the plan as originally announced, students registered for an advanced degree in the Medical College, but in all respects they were subject to the rules and regulations prevailing at the University. The departments offering graduate instruction were identified in the first announcement merely as the "scientific departments."

Graduate work has continued to occupy a place in the Medical College since the year it was established, and advanced degrees have been awarded in anatomy, bacteriology and immunology, biochemistry, pathology, pharmacology, physiology and biophysics, and public health and preventive medicine.

### THE GRADUATE SCHOOL OF MEDICAL SCIENCES

In June, 1950, the trustees of Cornell University approved a plan designed to utilize the staff and facilities of the Sloan-Kettering Institute for instruction leading to advanced degrees under the Graduate Faculty of the University. Since the Cornell University Medical College and the Sloan-Kettering Institute were already closely associated, arrangements have been carried forward which make possible a cooperative plan for graduate work. By action of the trustees in January, 1952, the Graduate School of Medical Sciences was established, which, with the approval of the Graduate Faculty of Cornell University, "shall have full responsibility for advanced and professional degrees granted for study in residence at the New York City campus of Cornell University."

### FACILITIES

#### THE MEDICAL COLLEGE

The five buildings of the College extending along York Avenue from Sixty-eighth to Seventieth Streets contain the classrooms, student labo-

ratories, library, and research facilities for undergraduate medical teaching and for students doing graduate work. The regular course of instruction to medical students is conducted for the most part on the second and third floors of the Medical College. Students in the Graduate School carry on their work on all floors of the College buildings. They are not only eligible to take any of the subjects with the regular medical students, but in most instances certain of these courses are required of the candidate for an advanced degree.

### THE SLOAN-KETTERING INSTITUTE

The Memorial Center for Cancer and Allied Diseases comprises the city block between York and First Avenues from Sixty-seventh to Sixty-eighth Street. In the center of the group of buildings on the Sixty-eighth Street side is located the Sloan-Kettering Institute, a thirteen story structure, devoted primarily to research work pertaining to cancer and allied conditions. Ample opportunities for advanced training are offered in the Institute by reason of its special facilities and its staff of experienced investigators. On the several floors of the building are located laboratories and modern equipment for studies in bacteriology, biochemistry, biophysics, cell physiology, experimental cancer chemotherapy, experimental pathology, immunochemistry, pharmacology, radiation biology, steroid metabolism, and virology.

### PURPOSE AND NATURE OF THE GRADUATE SCHOOL

It is the purpose of the Graduate School to offer facilities for advanced study and research so that students may obtain a comprehensive view of a field of knowledge and receive the training required for independent investigation in that field. In providing this opportunity, the School makes it possible for the students to associate freely with mature scholars who will give them such aid and direction as they may need. Accomplishment is judged primarily by the evidence of growing responsibility for the advancement of knowledge and not by fulfillment of routine requirements or by courses and credits. The Faculty of the School requires of all candidates for advanced degrees a period of study in residence, the mastery of some one subject, an adequate acquaintance with allied subjects, the passing of a final examination, and the presentation of a satisfactory thesis.

# GENERAL REGULATIONS

QUALIFIED students will be accepted in the Graduate School of Medical Sciences for work leading to the M.S. or Ph.D. degree and will carry out their program of study under the supervision of Faculty members who hold the rank of professor, associate professor, or assistant professor on the teaching staffs of Cornell University Medical College and the Sloan-Kettering Institute.

The training is designed to develop respect for truth and independent responsibility for achieving it. Insofar as accepted procedures for advanced study admit, the program of each candidate is individual and is planned to utilize all relevant resources of the two components of the Graduate School of Medical Sciences. Separate fields of instruction, however, are listed on other pages of this Announcement for the purpose of indicating administrative divisions and the major areas for advanced study.

The statements contained in this Announcement are intended to be mainly descriptive rather than regulatory. The regulations governing programs for advanced degrees are published by the Graduate Faculty in a pamphlet entitled *Code of Legislation*, which is available for consultation in the Administration Office of the Medical College.

## ADMISSION

To be admitted to the Graduate School of Medical Sciences, an applicant (1) must hold a baccalaureate degree from a college or university of recognized standing, or have done work equivalent to that required for such a degree; (2) must show promise of ability to pursue advanced study and research as judged by his previous scholastic record or otherwise; and (3) must have had adequate preparation to enter upon graduate study in the field chosen.

In most instances the number of candidates that can be accommodated in the different fields of study in the Graduate School of Medical Sciences is relatively small because of the specialized character of the work and limitations of facilities. *A student desiring to be considered for work in the Graduate School should, therefore, first decide on the field of his primary interest and then consult the professor in charge of this subject. If encouraged to proceed, the student may then submit his application and other credentials.*

An application for admission should be made on a special form for

that purpose, which may be obtained from the office of the Graduate School of Medical Sciences, 1300 York Avenue, New York 21, N.Y. No application will be acted upon until all the credentials enumerated in this form have been filed.

A student is not admitted to the Graduate School until a formal notice of acceptance has been issued by the Associate Dean of the Graduate School of Medical Sciences of Cornell University. If the candidate is accepted with conditions, these will be recorded in the notice of admission.

## CREDENTIALS

Graduates of American colleges and scientific schools approved by the district association, or the American Association of Universities, who hold a baccalaureate degree and who give other evidence of promise and ability to pursue graduate study are eligible to seek admission. For those who have studied in foreign universities where the degree is not given, documentary evidence will be required that the training completed is the equivalent of the degree.

The student seeking admission to the Graduate School of Medical Sciences is required to have submitted an official transcript of record covering all work taken previously, including any graduate studies as well as the undergraduate courses. In evaluating the acceptability of an applicant, it will be helpful to have two letters of recommendation from persons intimately acquainted with the applicant and qualified to judge his capacity to do graduate work. Since these letters form an essential part of the credentials of the applicant, they may be addressed directly to the department head or the professor concerned with the major field in which the student plans to do graduate work. Likewise, scores made in the Graduate Record Examination, although not required, will prove helpful in determining the acceptability of the applicant. The Graduate Record Examination is administered four times each year throughout the United States and Canada. It does not require any special preparation and may be taken upon application and the payment of moderate fees. Inquiries about the examination and applications for taking it should be addressed to the Educational Testing Service, P.O. Box 592, 20 Nassau St., Princeton, N.J.

For students planning to take up graduate work at the beginning of the academic year in September, the application and all supporting data should be in the office of the Graduate School at the Medical College not later than March first.

## REGISTRATION

Students taking work in the Graduate School leading to, or in contemplation of, an advanced degree must register in the Administration

Office of the Medical College at the beginning of each academic year. It is expected that students matriculated in the Graduate School of Medical Sciences will continue for the full academic year. In the event, however, that circumstances require attendance for less than a year, special arrangements may be made for registering for one semester. A graduate student who has completed the requirements of residence for his degree and who remains in residence while working on his thesis or while doing other work in contemplation of a degree must register each term in which he is thus engaged.

A graduate student who discontinues his work for any reason during a term in which he is registered should immediately report this fact to the Associate Dean in order to obtain an official withdrawal or an honorable dismissal.

## MAJOR AND MINOR SUBJECTS

The curriculum of a candidate for the degree of M.S. is one major and one minor subject; of a candidate for the degree of Ph.D., one major and two minor subjects. No variation in the number of subjects is allowable. Approved subjects are listed below as separate fields of instruction, where some information is given about them. Specific requirements for each subject are fixed by the member of the Faculty who represents the subject on the candidate's Special Committee; he requires whatever in his judgment is necessary to train the candidate, including registration for courses and supervised or independent study. Therefore, the program of one candidate bears no necessary relation to the program of another candidate registered for the same subject. The Faculty believes that in the main the ultimate aims of candidacy are best attained by the candidate's selecting one minor subject (in certain instances, two) outside the field of his major and a program of study arranged so as to contain a balance of research and course work leading to a high standard of proficiency.

In the Sloan-Kettering Institute there are no formal courses offered for graduate students. Candidates whose primary interest centers in this part of the Graduate School of Medical Sciences will find it profitable to elect as a minor subject part of the regular curriculum of the medical course.

## SPECIAL COMMITTEES

Special Committees are the means for directing individual candidates in the attainment of the scholarly independence implicit in advanced degrees. While a candidate is choosing his major and minor subjects, he selects, in consultation with the Associate Dean, eligible members of the Faculty to represent each subject and to serve as his Special Committee. The representative of the major subject is chairman. Any pro-

fessor, associate professor, or assistant professor is eligible to serve on these committees.

The members selected indicate their willingness to serve by signing the record of major and minor subjects, which is filed with the Associate Dean.

A candidate may change the membership of his Special Committee with the approval of all the members of the newly constituted Committee and of the Associate Dean.

Members of the Special Committee not only instruct or supervise the instruction of a candidate but also certify whether his progress is satisfactory or unsatisfactory, conduct Qualifying and Final Examinations, and approve the thesis. *Although they are the candidate's advisers, he alone is responsible for meeting the requirements of the Graduate School.*

## GRADES

Credit for graduate work is given only when the candidate maintains a satisfactory standard of performance in both his major and his minor fields of study. Professors having charge of the work of graduate students are required to report to the Associate Dean of the Graduate School of Medical Sciences at the end of each semester, or at the close of each academic year, grade ratings on all students taking work under their direction. These grade reports are given in the following terms: *A* (93–100%), *B* (84–93%), *C* (75–83%) for passable performance, and *F* for all work of an unacceptable standard.

Students whose grade average falls below a *B* may be separated from the Graduate School program.

## RESIDENCE REQUIREMENTS

The Faculty regards study in residence as essential. Although requisite depth results from intensive study of a major subject and properly related minor subjects, candidates for an advanced degree should avoid overspecialization.

Consequently, the Graduate Faculty requires of each candidate for a Master's degree a minimum of two residence units and for the doctorate, a minimum of six residence units. One residence unit represents one academic term of full-time study reported by the Special Committee as satisfactorily completed. The fractions of a unit counted toward this requirement, three-fourths, one-half, two-fifths, are granted for (1) study while assisting or instructing in the academic program; (2) study while employed in nonacademic work; (3) study which is reported by the Special Committee as only partially satisfactory; and (4) for satisfactory Summer Research which may be given a half unit of residence credit (in exceptional cases, three-fourths of a unit).

Eligibility to receive residence units and fractions of units is defined in the *Code of Legislation* of the Graduate Faculty.

### TRANSFER OF RESIDENCE

Since no degree is granted unless the candidate has studied in residence for at least two semesters, no residence unit or fraction is granted in fulfillment of the requirements for a Master's degree for study outside this Graduate School. For study in another recognized graduate school while in candidacy for an advanced degree, up to three units may be accepted in fulfillment of doctoral requirements by special action of the Associate Dean. No commitment may be made for acceptance of previous study in another graduate school in lieu of required residence until after the candidate has entered into study in residence in the Graduate School. Then the residence units recommended by the Special Committee on the basis of a transcript of record may not exceed those that would be earned under similar circumstances at Cornell. Study as a candidate or as a special student in an undergraduate college is not acceptable, even though the courses may be designed for graduate students. A candidate for the degree of Ph.D. must complete two of the last four units in successive terms of study at the Graduate School of Medical Sciences.

Each candidate for an advanced degree is expected to complete his study in residence with reasonable continuity. Under any circumstances, a candidate who fails to register during any period of four or more years is dropped from candidacy and may be readmitted only after his Special Committee has stipulated the amount of additional residence to be required. No more than ten years may intervene between the time of first registration and the completion of all requirements for a degree.

### LANGUAGE REQUIREMENTS

A language committee consisting of three members of the Faculty of the Graduate School of Medical Sciences is responsible for evaluating the language proficiency of candidates for advanced degrees.

To demonstrate proficiency, the candidate is required to pass a general written examination. The examination will consist of passages from the biological sciences designed to test the student's ability to translate a representative piece of prose. The examination will be graded "pass" or "fail" on the basis of whether the student has demonstrated sufficient speed and accuracy to make language a useful instrument for research. The use of a dictionary is allowed. The examination will be offered within one month following registration in the fall and spring terms. By special arrangement it may also be taken in the summer.

A vocabulary test may, at the discretion of the Language Committee, be required in addition to the above general examination.

### THE MASTER'S DEGREE

Students taking major work for a Master's degree must demonstrate to the Language Committee proficiency in one foreign language. A candidate who does not demonstrate proficiency within one month of first registration may be required to complete a minimum of three residence units for the degree and must demonstrate proficiency before beginning the third residence unit.

### THE DOCTOR OF PHILOSOPHY DEGREE

Students matriculated for the doctoral degree must demonstrate, to the satisfaction of the language committee, proficiency in two languages in addition to the one the candidate commonly uses. Proficiency in English and German is required, and for the third language, either French or Spanish will fulfill the language requirement. The examination in one foreign language should be passed within the first month after matriculation in graduate study. A delay in fulfilling the proficiency requirement in one language may necessitate extending to seven the minimum required residence units for the doctoral degree. The second language examination should be taken as soon as possible after admission to candidacy. Until it is passed, no residence units beyond four will be allowed.

### EXAMINATIONS

Three oral or oral and written examinations are required by the Graduate Faculty: (1) a Final Examination for the Master's degree; (2) a Qualifying Examination for the degree of Ph.D.; (3) a Final Examination for the degree of Ph.D. Under certain regulations (1) and (2) may be combined. Although other members of the Faculty may be invited to examine the candidate, the Special Committee alone decides whether he has passed or failed. The Qualifying Examination has the double purpose of determining the ability of the candidate to pursue doctoral studies and of allowing the Special Committee and candidate to plan together a satisfactory program for completion of candidacy. The Qualifying Examination should be taken as early as possible; at all events, the candidate must complete at least three units of residence after passing it. The Final Examination for the doctorate is given in two parts. The first part is on the major and minor subjects (Exam. A) and may be given as much as two terms before the second part on the thesis and related material (Exam. B). Final Examinations are scheduled by the Associate Dean and are announced to the Graduate Faculty so that any member may attend who wishes to do so.

The Special Committee may require any examination which it deems desirable in addition to the three noted above.

## ESSAYS AND THESES

Programs in candidacy for the Master's degree are intended to be individually planned and may range widely in content and method. Depending upon the desires and needs of the candidate and the discretion of the Special Committee, they may be composed largely of courses in restricted fields or of informal study under guidance; they may be designed to terminate formal education or to prepare for further advanced study or they may center in a single problem or investigation. At least fifteen days before the Final Examination, the candidate must have an essay or thesis in the hands of his Special Committee, which is acceptable to the Graduate Faculty in both scholarship and literary quality.

A candidate for the doctorate must present a thesis, approved by all members of the Special Committee, which is acceptable to the Graduate Faculty in both scholarship and literary quality and which demonstrates the candidate's respect for truth and independent responsibility for achieving it. Ordinarily, but not necessarily, the thesis is written in the candidate's major field and under the direction of the chairman of his Special Committee. The plan in effect in the Graduate School of Cornell University of using the facilities of the University Microfilms, Ann Arbor, Michigan, has been adopted by the Faculty of the Medical College. This arrangement provides for publication of the thesis on microfilm and for the publication of an abstract of the dissertation of not more than 600 words in the monthly publication entitled *Dissertation Abstracts*.

The thesis must be typewritten, double-spaced, on durable rag bond 8½ by 11 inches, with a left-hand margin of at least an inch and a quarter. A new black ribbon should be used so as to obtain a clear dense copy for each page, and the ribbon copy (original) must be deposited with the Associate Dean for transfer to the Medical College Library and for microfilming. One carbon copy, which should be on paper of lighter weight than bond, is also required for deposit in the department where the thesis work was done. Both original and the one carbon copy of the thesis are submitted unbound.

## NONCANDIDATES

Wherever staff and facilities are available, students may be admitted as noncandidates and register for such formal or informal instruction as they are adequately prepared to undertake. The work of a non-candidate is under the supervision of an adviser selected by the student

and approved by the Associate Dean. He is subject to the general regulations of the Graduate Faculty.

An applicant for admission as candidate for an advanced degree may be advised by the Associate Dean to enter as a noncandidate because his record or statement of training and intentions does not clearly indicate his ability to pursue study in candidacy. In such instances the non-candidate may reapply for admission to candidacy after a period of study not exceeding two semesters. If he is admitted into candidacy, he is not allowed to transfer in fulfillment of residence requirements more than one semester of study.

A student desiring to change from noncandidacy to candidacy, or from a Master's degree to a Doctor's degree without completing the former, must file a new application with the Associate Dean.

## EXPENSES

### GENERAL REGULATION

Tuition and fees become due when the student registers. Any student who fails to pay his indebtedness at the Business Office is thereby dropped from the Graduate School unless the Assistant Treasurer has granted him an extension of time to complete payment. The Assistant Treasurer is permitted to grant such an extension when, in his judgment, the circumstances of a particular case warrant his doing so. A reinstatement fee of \$5 may be assessed against any student permitted to continue or return to his studies after being dropped for default in payments. The assessment may be waived in any instance for reasons satisfactory to the Assistant Treasurer and the Associate Dean, when such reasons are set forth in a written statement.

*A tuition fee or other fee may be changed by the Board of Trustees at any time without previous notice.*

### COMPREHENSIVE FEE

Each student matriculated in the Graduate School is required to pay a general charge of \$175 an academic year, which covers all accessory fees, including matriculation, student hospitalization insurance, laboratory charges, graduation fee, microfilming of the doctoral thesis, publishing the abstract in the monthly periodical, *Dissertation Abstracts*, mailing the thesis and abstract to and from the microfilm publishers, and binding two copies of the thesis.

### TUITION

A tuition fee of \$925 an academic year (\$462.50 a semester) must be paid by *all students* registered in the Graduate School of Medical Sciences. This charge is payable at the beginning of the academic year, or in two equal parts at the beginning of the fall and spring semesters.

*The schedule of charges, as shown above for Comprehensive Fee and Tuition, becomes effective at the beginning of the academic year, 1957-1958. For the session 1956-1957, the charges will be the same as for 1955-1956.*

Graduate students who have completed the minimum residence requirements (six units) for the Ph.D. degree and have paid the tuition fees for that degree may complete their theses in residence and take the final examinations by registering as candidates for degree only, and no additional tuition payment will be required of them.

The head of a department may recommend that a certain graduate student is needed in the teaching program, and, if approved by the Associate Dean, a salary will be given to the student in an amount equal to his tuition exclusive of other fees. The tuition charge as such, however, is not waived in any instance; therefore, all graduate students are required to pay this fee.

## SUMMARY OF REGULATIONS FOR GRADUATE DEGREES

Students contemplating admission to graduate work leading to the M.S. or Ph.D. degree must first obtain the approval of their program from a member of the Faculty. If encouraged by the Faculty member to proceed, the student may file his application (see page 9).

When registered for one of these degrees, the candidate should observe carefully the following requirements.

### FOR THE MASTER'S DEGREE

He must—

1. Complete a minimum of two units\* of work in residence, including a major and one minor course of study.
2. Demonstrate proficiency in one foreign language.
3. Pass a Final Examination covering his general field of study.
4. Present a thesis or essay approved by his Special Committee.
5. Submit two typewritten copies of the thesis, one for filing in the Medical College Library and the other for the department representing his major field of study.

### FOR THE PH.D. DEGREE

He must—

1. Complete six units\* of training in residence, of which two units of the last four must be taken in successive terms at the Medical College or the Sloan-Kettering Institute.

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\*One unit is equivalent to a semester of full-time study.

2. Demonstrate proficiency in English† and German and one other language approved by the Language Committee.

3. Achieve a high level of scholarly capacity (grade of B or better) and demonstrate the ability and technic necessary for carrying on original work.

4. Complete the following examinations: (a) a Qualifying Examination before three units are finished of the six required for the doctoral degree, and (b) the final examinations (see page 14).

5. Present a thesis in the major field of study, which must represent a contribution to the subject investigated.

6. Prepare an abstract of the approved thesis for publication in *Dissertation Abstracts*.

7. Submit two unbound typewritten copies of the thesis, one for filing in the Medical College Library and the other for the department representing the major field of study.

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†This applies only to foreign students.

# FIELDS OF INSTRUCTION

THE SEVERAL fields of instruction of the Graduate School of Medical Sciences are described in the pages that follow. The title of each field is an approved major or minor subject for candidates for advanced degrees.

## INSTRUCTION AT THE MEDICAL COLLEGE

### ANATOMY

*Professors* DON W. FAWCETT (*Chairman*), JOSEPH C. HINSEY

*Associate Professor* JOHN MACLEOD

*Assistant Professors* WILBUR D. HAGAMEN, LAWRENCE W. HANLON

Facilities are available for graduate study in various areas of the broad subject of anatomy; histology, cytology, electron microscopy, neuroanatomy, experimental neurology, endocrinology, embryology, and gross human anatomy. Students desiring to pursue graduate work in anatomy must have had adequate preliminary training at college level in physics, chemistry, and biology. The specific course requirements for either a major or a minor in anatomy will be determined for each candidate after consultation with the authorized representatives of the other departments involved.

### BIOCHEMISTRY

*Professor* VINCENT DU VIGNEAUD

*Associate Professors* ROY BONSNES, DONALD B. MELVILLE, JULIAN R. RACHELE

*Assistant Professors* HELENA GILDER, PANAYOTIS KATSOYANNIS

Opportunity is offered for advanced work and research in various phases of biochemistry. Adequate chemical and physical equipment and library facilities are provided for the investigation of a considerable variety of problems in the chemistry of the animal and human organism in health and disease.

Graduate students expecting to pursue investigations in biochemistry should have adequate training in inorganic, organic, analytical, and physical chemistry.

Students electing biochemistry as a minor subject are expected to complete the regular medical course in biochemistry, or its equivalent, as a minimum requirement.

### MICROBIOLOGY AND IMMUNOLOGY

*Professor* JAMES M. NEILL

*Associate Professor* JOHN Y. SUGG

*Assistant Professor* DOROTHY S. GENGHOF

Facilities are available for advanced study and investigation over a broad range in the general field of microbiology and immunology, including subjects directly related to the etiology, epidemiology, and pathogenesis of infectious disease, and also aspects of fundamental importance whose practical application may not be immediately apparent. A graduate student may elect investigations in any of the various

aspects, but the opportunities are best for students who direct their major interest toward some aspect related to the fields of current investigation of the department. These fields at present include the synthesis of polysaccharides by microorganisms, and by enzymes derived from them, and the serological properties of the polysaccharide products; variations in antigenicity and in pathogenicity of influenza viruses; and immunological aspects of fungi and of mycotic infections.

Prospective majors in the department should have had several college courses in chemistry, physics, and biology. As a rule, considerably more training in chemistry is expected than is needed to meet the minimum requirements for entrance to medical college, but unusual training or experience in any one of the sciences will be taken into account in the consideration of candidates who may have had less than the usual training in others.

## PATHOLOGY

*Professors* JOHN G. KIDD, JOHN M. PEARCE

*Associate Professors* JOHN T. ELLIS, AARON KELLNER, GEORGE E. MURPHY, CHARLES T. OLCOTT, F. STEPHEN VOGEL

*Assistant Professors* GOETZ W. RICHTER, JOHN F. SEYBOLT

The department offers wide opportunity for the experimental study of disease. Adequate facilities for the care of animals are available. There is a departmental library where some of the current journals and reference books are kept on file. The main library is situated on the floor immediately beneath the department and is readily accessible. There is a carefully selected collection of mounted museum specimens, in addition to an active file of preserved gross material for study. The histological collection is likewise rich in material. Autopsies for the entire hospital are performed by the members of the department and offer an opportunity for the study of fresh pathological tissues.

No regular course of study is offered by the department for graduate students, but applicants in this field are given abundant opportunity for special work under the direct supervision of members of the department. Such work may include the investigation of some problem and may be credited toward the applicants' graduate degree.

## PHARMACOLOGY

*Professors* WALTER F. RIKER, JR. (*Chairman*), MCKEEN CATTELL, HARRY GOLD

*Associate Professor* WALTER MODELL

*Assistant Professors* SOLOMON GARB, JOSEPH F. REILLY, JAY ROBERTS

Facilities are available for advanced work and research in both the chemical and pharmacodynamic aspects of pharmacology. Special opportunities are offered for work in the pharmacology of muscle-nerve, enzyme systems, the circulation, the autonomic nerves, and toxicology. The department is well equipped with special apparatus, including electrocardiographs, tissue metabolism techniques, spectrophotometers, and galvanometers for the measurement of heat production in tissues.

Arrangements will be made for individuals or groups to participate in original investigations in ward patients and in ambulatory patients of the clinics. There are special opportunities for work on digitalis, the mercurial diuretics, cinchona alkaloids, and other problems related to the pharmacology of cardiovascular disorders.

An adequate preliminary training in chemistry and physiology is prerequisite for graduate work in pharmacology.

## PHYSIOLOGY AND BIOPHYSICS

*Professor* ROBERT F. PITTS

*Associate Professors* ROGER L. GREIF, ROY C. SWAN, DAVID D. THOMPSON

*Assistant Professor* FRANK G. CARPENTER

Graduate and research training is provided for students who wish to prepare themselves for teaching and research in the physiological aspects of biological science, with special emphasis on the physical and chemical approach; those who desire to prepare themselves more adequately for clinical practice and research by advanced training in some phase of physiology; and those who are entering a career in human biology.

Instruction is at first provided through the medium of formal basic courses in this and other departments of the Medical College, and in the departments of physics and chemistry of neighboring universities. This work is paralleled by similar courses which deal with specialized subjects on a more advanced level. Finally, the student is associated with various members of the staff on a tutorial basis for instruction in special research problems.

## PUBLIC HEALTH AND PREVENTIVE MEDICINE

*Professor* WALSH McDERMOTT

*Associate Professor* EDWIN D. KILBOURNE

*Assistant Professors* IRWIN D. J. BROSS, BENJAMIN H. KEANE, ROBERT McCUNE, KURT W. DUESCHLE

In this department of the Medical College, a graduate degree (Ph.D.) may be obtained in medical sciences as they relate to public health. Microbiology is a field of special interest of the department; advanced training and instruction are available in parasitology, bacteriology, and virology.

The Department of Public Health and Preventive Medicine does not offer formal graduate courses in public health, and the University does not grant advanced degrees in public health.

## INSTRUCTION AT THE SLOAN-KETTERING INSTITUTE

Cornelius P. Rhoads, *Director*

A. R. T. Denués, *Assistant to the Director*

The type of training offered in this division of the Medical College is primarily for candidates with the Master's degree or equivalent.

## BIOCHEMISTRY

*Professors* OSCAR BODANSKY, GEORGE B. BROWN, THOMAS F. GALLAGHER

*Associate Professors* AARON BENDICH, LIEBE F. CAVALIERI, DAVID K. FUKUSHIMA, MARY L. PETERMANN, DONALD W. VISSER

*Assistant Professors* M. EARL BALIS, H. LEON BRADLOW, JACK J. FOX, LEONARD KORN-GOLD, MAURICE M. RAPPORT, ROBERT S. ROSENFELD, HELEN Q. WOODARD

Training is available in the following fields: electrolyte metabolism; enzymology; immunochemistry; chemistry and metabolism of proteins, especially nucleoproteins; chemistry and metabolism of steroids.

Prerequisites include acceptable graduate courses in organic and physical chemistry, biochemistry, and physiology, together with additional requirements in conformance with the individual desires of the students and the interests of the staff.

## BIOLOGY AND GROWTH

*Professors* JOHN J. BIESELE (Biology), CORNELIUS P. RHOADS (Pathology). C. CHESTER STOCK (Biochemistry), GEORGE W. WOOLLEY (Biology)

*Associate Professors* DONALD A. CLARKE (Pharmacology), ALICE E. MOORE (Biology),  
FREDERICK S. PHILLIPS (Pharmacology), H. CHRISTINE REILLY (Microbiology), MAR-  
JORIE BASS ZUCKER (Physiology)

*Assistant Professors* RALPH K. BARCLAY (Biochemistry), A. R. T. DENUES (Biology),  
LEONARD D. HAMILTON (Biology), DORRIS J. HUTCHISON (Microbiology), ROBERT C.  
MELLORS (Pathology), WILLIAM L. MONEY (Biology), HELEN W. TOOLAN (Pathology)

Students are directed particularly toward the factors which initiate, control, and modify the growth of normal and neoplastic tissues. Following this orientation, training is available in pharmacology, experimental cancer chemotherapy, microbiology, endocrinology, genetics, and virology.

Prerequisite courses will be determined for each individual on the basis of his particular area of interest.

## BIOPHYSICS

*Professor* JOHN S. LAUGHLIN

*Associate Professor* HAROLD BEYER

*Assistant Professor* THEODORE HALL

There are special facilities for radiologic physics (including high-energy phenomena), radiobiology, tracer work (stable and radioactive), radioautography, soft X-ray absorption, electronics, theory and practice of radiation detection.

Prerequisites include acceptable courses in physics, mathematics through calculus, and acceptable laboratory experience, supplemented by studies in fields closely related to biophysics.

## PATHOLOGY

*Professor* FRED W. STEWART

*Associate Professor* FRANK W. FOOTE, JR.

*Assistant Professors* LEOPOLD G. KOSS,\* LOUIS G. ORTEGA, THOMAS SIMON, STEPHEN S. STERNBERG

Special facilities are available for investigation in quantitative cytology and cellular pathology by newer optical methods, cytophysical methods including radioautography, ultraviolet and fluorescent microscopy, and X-ray absorption techniques.

Study in this department is limited to persons holding a medical degree, at least one year of clinical internship, and two years of general pathology.

## PREVENTIVE MEDICINE

*Professor* EMERSON DAY

*Associate Professor* ERNEST L. WYNDER

*Assistant Professors* GENEVIEVE M. BADER, WALTER O'DONNELL, LOUIS VENET, SAI-HOU YING

Opportunity for clinical experience in methods of cancer detection is offered in the Strang Clinic by arrangement with the department head. Training in cytologic screening and diagnosis is available by special arrangement with the director of the Strang Laboratory of Cytology.

The department offers opportunities for research in early cancer and precancer, cytology, epidemiology of cancer, and biological testing of environmental agents. Special studies in these fields can be arranged with the appropriate members of the department.

Prerequisites are a degree in medicine or advanced training and experience in the field concerned.

\*On military leave.

# REGISTER OF STUDENTS

## DOCTORS OF PHILOSOPHY

- Edward Berg, B.A. 1948, Brooklyn College; Ph.D. 1955,  
Cornell University. Major: Parasitology. Brooklyn, N.Y.
- George Anthony Condouris, B.S. 1949, Rutgers University;  
M.S. 1951, Yale University; Ph.D. 1955, Cornell  
University. Major: Pharmacology. New Haven, Conn.

## MASTERS OF SCIENCE

- Robert James Brotherton, B.A. 1951, University of  
California; M.S. 1955, Cornell University.  
Major: Biochemistry. Santa Barbara, Calif.
- Lucille Wright, B.A. 1950, Colorado University; M.S.  
1955, Cornell University. Major: Anatomy. Springfield, Mo.

## CANDIDATES FOR THE DEGREE OF DOCTOR OF PHILOSOPHY

- June Lee Biedler, B.A. 1947, Vassar College; M.A.  
1954, Columbia University. Major: Biology. New York, N.Y.
- Alfredo Giner-Sorolla, Dr. Pharm. 1954, University  
of Barcelona. Major: Biochemistry. Barcelona, Spain
- Louis Kaplan, B.S. 1949, College of the City of  
New York; M.S. 1950, University of Kansas.  
Major: Microbiology. New York, N.Y.
- Albert S. Kuperman, B.A. 1952, New York University  
Major: Pharmacology. New York, N.Y.
- Abel Alfred Lazzarini, M.D. 1951, University of  
Buenos Aires Medical College. Major: Biology. Buenos Aires, Argentina
- Martha Ludwig, B.A. 1952, Cornell University.  
Major: Biochemistry. Pittsburgh, Pennsylvania
- Alexander H. Pinkes, B.S. 1947, University of  
Connecticut; M.S. 1953, University of Kentucky.  
Major: Bacteriology. Hartford, Connecticut
- Kathryn Marilyn Smart, B.S. 1945, University of  
Michigan; M.A. 1951, Teachers College, Columbia.  
Major: Parasitology. Larchmont, N.Y.
- Audrey Larack Stone, B.S. 1948, University of  
Chicago; M.S. 1951, University of Southern  
California. Major: Biochemistry. New York, N.Y.

- John J. Taylor, B.A. 1953, Hofstra College  
Major: Anatomy. Levittown, N.Y.
- Ralph Vinegar, B.A. 1948, M.S. 1949, New York  
University. Major: Biology. New York, N.Y.
- Virginia Spicer Weliky, B.S. 1948, Randolph-Macon  
College. Major: Biochemistry. Kew Garden Hills, N.Y.
- Robert Winfield Wood, B.S. 1953, University of  
Detroit; M.A. 1955, Vanderbilt University  
Major: Biophysics. New York, N.Y.

## CANDIDATE FOR THE DEGREE OF MASTER OF SCIENCE

- Robert Jack Schulz, B.S. 1950, Queens College.  
Major: Physics. Yorktown Heights, N.Y.

## STUDENTS TO ENTER, SEPTEMBER, 1956

- Beverly Singer Cohen, B.A. 1953, Bryn Mawr College.  
Major: Radiation Physics. New York, N.Y.
- Milton Danzker, B.S. 1942, College of the City of  
New York; M.A. 1947, Columbia University.  
Major: Biophysics. Brooklyn, N.Y.
- Marie Dingman Felix, B.S. 1956, The American  
University. Major: Anatomy. Spring Valley, N.Y.
- Dietrich E. Fischer, B.S. 1953, University of  
Missouri. Major: Biochemistry. New York, N.Y.
- Mary Jane Gill Hamilton, B.A. 1947, University  
of Buffalo; M.S. 1950, Polytechnic Institute  
of Brooklyn. Major: Biochemistry. New York, N.Y.
- Herbert Rosenkranz, B.S. 1954, College of the  
City of New York. Major: Biochemistry. New York, N.Y.
- Bertram Spector, B.E.E. 1945, College of the City  
of New York. Major: Physics. East Paterson, N.J.
- George E. Thompson, M.S. 1949, Montana State  
University. Major: Immunology. New York, N.Y.
- Barbara Helen Weiss, B.A. 1954, Brooklyn College;  
M.S. 1955, Rutgers University.  
Major: Microbiology. New York, N.Y.



